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EXAMINER	
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ART UNIT	**PAPER NUMBER**
2625	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/021,111	CARRIG, JAMES J.	
	Examiner	Art Unit	
	Sath Perungavoor	2625	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12/11/2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-38* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-38* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *11 December 2001* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. Figure 7 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.121(d)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

2. Claim 35 is objected to because of the following informalities: Line 4 should be changed from "an input an output" to "an input and an output". Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-9 and 11-38 are rejected under 35 U.S.C. 102(b) as being anticipated by Bender et al. (U.S. Patent Number 5,657,402).

Regarding claim 1, Bender et al. discloses a method for image enhancement comprising (Col. 3, Lines 2-4):

receiving an input image (402 in Fig. 12; The figure shows the receiving of the input image for processing and enhancement.),

matching regions of the input image to other available data (Fig. 5, Col. 9, Lines 13-17; The image regions are matched with other higher resolution data and this process is shown in fig. 5, where 201 is matched with data 300.);

forming a combined image containing some pixels spaced more closely than the input image (Fig. 5, Col. 17, Lines 30-34; Fig. 5 shows clearly that certain regions like 300 have pixels closely spaced than the input image 201.), and

generating an output image at a resolution finer than the input image resolution (Col. 3, Lines 2-9; The cited reference's invention involves image resolution enhancement and this involves generating an output image at a resolution finer than the input image resolution.).

Regarding claim 2, Bender et al. discloses the method according to claim 1, wherein the output image resolution is greater than the input image resolution and less

than or equal to the resolution of the combined image (Col. 3, Lines 2-9; Col. 9, Lines 27-35).

Regarding claim 3, Bender et al. discloses the method of claim 1 wherein generating an output image at a resolution finer than the input image resolution further comprises applying a least squares filter to generate each output pixel (Col. 10, Lines 48-49).

Regarding claim 4, Bender et al. discloses the method of claim 1 wherein generating an output image at a resolution finer than the input image resolution further comprises operating on at least one of input image pixels and combined image pixels to generate each output image pixel at a resolution finer than the input image resolution (Col. 9, Lines 27-35).

Regarding claim 5, Bender et al. discloses the method according to claim 4, wherein operating further comprises applying a filter to generate each output pixel (Col. 12, Lines 4-7).

Regarding claim 6, Bender et al. discloses the method according to claim 5, wherein the filter is an optimal least squares filter for each output pixel (Col. 10, Lines 48-51).

Regarding claim 7, Bender et al. discloses the method of claim 6 wherein the optimal least squares filter for each output pixel is based on an irregular sample grid (Col. 10, Lines 48-49; Col. 9, Lines 28-35).

Regarding claim 8, Bender et al. discloses the method of claim 1 wherein other available data may change over time (Col. 5, Lines 60-66).

Regarding claim 9, Bender et al. discloses the method of claim 1 wherein the image and other available data are video images in a home networking database (Col. 5, Lines 54-60).

Regarding claim 11, Bender et al. discloses a processing system comprising a processor, which when executing a set of instructions performs the method of claim 1 (Col. 6, Lines 3-10).

Regarding claim 12, Bender et al. discloses a machine-readable medium having stored thereon instructions, which when executed performs the method of claim 1 (Col. 6, Lines 3-10).

Regarding claim 13, Bender et al. discloses the machine-readable medium of claim 12 wherein the input image is retrieved from and the output image is stored to a home networked database (Col. 5, Lines 54-60).

Regarding claim 14, Bender et al. discloses an apparatus for image enhancement comprising (Col. 3, Lines 2-4):

means for receiving an input image (402 in Fig. 12; The figure shows the receiving of the input image for processing and enhancement.),

means for matching regions of the input image to other available data (Fig. 5, Col. 9, Lines 13-17; The image regions are matched with other higher resolution data and this process is shown in fig. 5, where 201 is matched with data 300.);

means for forming a combined image containing some pixels spaced more closely than the input image, and (Fig. 5, Col. 17, Lines 30-34; Fig. 5 shows clearly that certain regions like 300 have pixels closely spaced than the input image 201.)

means for generating an output image at a resolution finer than the input image resolution (Col. 3, Lines 2-9; The cited reference's invention involves image resolution enhancement and this involves generating an output image at a resolution finer than the input image resolution.).

Regarding claim 15, Bender et al. discloses the apparatus according to claim 14, wherein the output image resolution is greater than the input image resolution and less than or equal to the resolution of the combined image (Col. 3, Lines 2-9; Col. 9, Lines 27-35).

Regarding claim 16, Bender et al. discloses the apparatus of claim 14 wherein means for generating an output image at a resolution finer than the input image resolution further comprises applying a filter to generate each output pixel (Col. 12, Lines 4-7).

Regarding claim 17, Bender et al. discloses the apparatus of claim 14 wherein means for generating an output image at a resolution finer than the input image resolution further comprises operating on at least one of input image pixels and combined image pixels to generate each output image pixel at a resolution finer than the input image resolution (Col. 9, Lines 27-35).

Regarding claim 18, Bender et al. discloses the apparatus according to claim 17, wherein means for operating further comprises solving a least squares problem to generate each output pixel (Col. 10, Lines 48-49).

Regarding claim 19, Bender et al. discloses the apparatus according to claim 18, wherein the solution to the least squares problem is an optimal least squares filter for each output pixel (Col. 10, Lines 48-51).

Regarding claim 20, Bender et al. discloses the apparatus of claim 19 wherein the optimal least squares filter for each output pixel is based on an irregular sample grid (Col. 10, Lines 48-51; Col. 9, Lines 28-35).

Regarding claim 21, Bender et al. discloses the apparatus of claim 14 wherein other available data may change over time (Col. 5, Lines 60-66).

Regarding claim 22, Bender et al. discloses the apparatus of claim 14 wherein the image and other available data are video images in a home networking database (Col. 5, Lines 54-60).

Regarding claim 23, Bender et al. discloses a system comprising a processor, which when executing a set of instructions, performs the following (Col. 6, Lines 3-10):

retrieves a first video image at a first resolution (402 in Fig. 12; The figure shows the receiving of the first image at a first resolution for processing and enhancement.);

forms a second video image at a second resolution and (201 at Fig. 5; Col. 5, Lines 58-60; Col. 17, Lines 30-34; The image regions are matched with other higher resolution data and a second image is created at a second resolution.);

generates a third video image at a third resolution (201 at Fig. 4, Col. 5, Lines 58-60; Col. 9, Lines 27-35; Col. 3, Lines 2-9; The second image data is interpolated to create a third image at a third resolution.).

Regarding claim 24, Bender et al. discloses the system of claim 23 wherein the third resolution is greater than the first resolution, and less than or equal to the second resolution (Col. 3, Lines 2-9; Col. 9, Lines 27-35).

Regarding claim 25, Bender et al. discloses the system of claim 23 wherein the images may have missing pixels (Col. 9, Lines 27-35).

Regarding claim 26, Bender et al. discloses the system of claim 23 wherein the second and third video image may change over time (Col. 5, Lines 60-66).

Regarding claim 27, Bender et al. discloses the system of claim 23 wherein generating a third video image at a third resolution further comprises applying an optimal least squares filter for each output pixel (Col. 10, Lines 48-51).

Regarding claim 28, Bender et al. discloses the system of claim 23 wherein the video images are located on a home networking database (Col. 5, Lines 54-60).

Regarding claim 29, Bender et al. discloses an apparatus comprising (Fig. 12):

means for receiving an input image having pixels at a first resolution (402 in Fig. 12; The figure shows the receiving of the first image at a first resolution for processing and enhancement.);

means for receiving other available data having pixels at a second resolution (300 at Fig. 3; Col. 7 Lines 20-26; The image regions with second resolution data are gathered as shown in 300.);

means for forming a combined image containing some pixels spaced more closely than the input image, and (Fig. 5, Col. 17, Lines 30-34; Fig. 5 shows clearly that certain regions like 300 have pixels closely spaced than the input image 201.);

means for generating an output image at a resolution finer than the input image resolution by applying a filter to the combined image pixels (Col. 3, Lines 2-9; Col. 12, Lines 4-7; The cited reference's invention involves image resolution enhancement and this involves generating a filtered output image at a resolution finer than the input image resolution.).

Regarding claim 30, Bender et al. discloses the apparatus of claim 29 wherein the filter is a least squares filter (Col. 10, Lines 48-49).

Regarding claim 31, Bender et al. discloses the apparatus of claim 30 wherein the least squares filter is optimal for each output image pixel (Col. 10, Lines 48-51).

Regarding claim 32, Bender et al. discloses the apparatus of claim 29 wherein applying a filter to the combined image pixels is means for applying the filter by a numerical tap method (Equation 10).

Regarding claim 33, Bender et al. discloses the apparatus of claim 29 where the means for forming a combined image is means for motion compensation (Col. 20, Lines 51-54).

Regarding claim 34, Bender et al. discloses a machine-readable medium having stored thereon information representing the apparatus of claim 29 (Col. 6, Lines 3-10).

Regarding claim 35, Bender et al. discloses an apparatus for image enhancement comprising:

a first device having an input and an output, the input coupled to receive a first image to be enhanced (406 and 410 in Fig. 12);

a second device having an input an output, the input coupled to receive a second image (408 in Fig. 12);

a third device having a first input, a second input, and an output, the first input coupled to receive the first device output, and the second input coupled to receive the second device output and (412 in Fig. 12);

a fourth device having an input and an output, the input coupled to receive the third device output and the fourth device output coupled to send a third enhanced image (414 in Fig. 12).

Regarding claim 36, Bender et al. discloses the apparatus of claim 35 wherein the first device input and second device input are coupled to a home network (Col. 5, Lines 54-60).

Regarding claim 37, Bender et al. discloses the apparatus of claim 35 wherein the fourth device output is coupled to a home network (Col. 5, Lines 54-60).

Regarding claim 38, Bender et al. discloses the apparatus of claim 35 wherein the third device further comprises a least squares filtering device having an input and an output, the input coupled to receive an image, the output coupled to send a filtered image (Col. 10, Lines 48-49).

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bender et al. in view of Ishikawa et al. (U.S. Patent Number 6,155,726).

Bender et al. meets the restrictions as set forth in the discussion for claim 10. However, Bender et al. does not expressly disclose the transfer of payment for the viewing of the output image.

In the same field of endeavor, Ishikawa et al. discloses the transfer of payment for the output image (Col. 5, Lines 65-67).

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify the teachings of Bender et al. and develop a method for transfer of payment for viewing of the output image. Since, one would not commonly expect the image enhancement services to be performed at no cost to the user.

Other Prior Art Cited

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Tom (US 4,683,496) discloses a method for resolution enhancement using reference images.

Dinan et al. (US 4,924,521) discloses a method for generating high resolution images by combining high and low resolution images.

Weldy (US 5,297,219) discloses a method for generating high resolution images by combining high and low resolution images.

Contact Information

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sath Perungavoor whose telephone number is (703) 306-4116. The examiner can normally be reached on Monday to Friday from 8:30am to 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta whose telephone number is (703) 308-5246, can be reached on Monday to Friday from 9:00am to 5:00pm. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Sath Perungavoor
Art Unit 2625
29 October 2004

KANJIBHAI PATEL
PRIMARY EXAMINER